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ATTORNEY DOCKET NO. **213899.00014** PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	)	
	:	Examiner: Vincent P. Barth
JACK BRASS	)	
	:	Group Art Unit: 2877
Application No.: 10/021,574	)	
	:	Confirmation Number: 1008
Filed: December 21, 2001	)	
	:	
For: METHOD OF PRODUCING AN ULTRA-VIOLET OR NEAR ULTRA-VIOLET LIGHT SOURCE FOR NON-DESTRUCTIVE INSPECTION TESTING	)	July 11, 2005 (Monday)

MAIL STOP APPEAL BRIEF -- PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANT'S BRIEF ON APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Having filed a Notice of Appeal on May 10, 2005, submitted herewith for the above-identified application are three copies of an Appeal Brief.

The Commissioner is hereby authorized to charge Deposit Account No. 50-1710 $250.00 for the fee for a small entity under 37 C.F.R. §1.17(c) for consideration of the instant Appeal Brief. Any additional fee, and any overpayments, should also be charged to Deposit Account No. 50-1710.

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REAL PARTY IN INTEREST

The real party in interest to the above-identified application and to this appeal is the assignee, BRASSCORP LIMITED, by virtue of an Assignment from the inventor, Jack Brass, recorded on March 18, 2002 at Reel 012695, Frame 0032.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claim 35 is the only claim pending in the application. Claim 35 is an independent claim.

As set forth in the final Office Action mailed December 14, 2004, independent Claim 35 stands rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,590,220 to Kalley et al. (hereinafter, "Kalley") in view of Applicant's admissions of prior art.

Claim 35 is reproduced in the Appendix submitted herewith.

STATUS OF AMENDMENTS

All amendments have been entered.

SUMMARY OF THE INVENTION

In general, as described at page 4 of the originally-filed application, the invention provides an apparatus for use with a body to be tested for faults using a luminescent material. The apparatus includes at least one light-emitting diode ("LED") capable of emitting radiation to excite the luminescent material, and a power supply connected to the at least one LED to provide the LED with electricity.

In particular, the invention provides an inspection lamp for detecting leaks in liquid or air circulating systems by detecting a fluorescent detection dye leaking from the system. The lamp includes: a) a flashlight having a housing; b) a plurality of LEDs housed within the housing and arranged in a cluster or array of less than 2 inches diameter; and c) batteries contained within the flashlight to supply direct current power to the LEDs, the LEDs in total consuming 7.2 watts or less. The flashlight is untethered and handheld. Each LED produces a narrow beam of approximately 30 degrees or less that projects directionally intense radiation. The radiation is emitted directly, without reflection, from the LEDs to the system that is beyond the housing of the flashlight. The radiation is unfiltered between the LEDs and the system. Each LED emits violet, near ultraviolet radiation having most of its energy within a visible range of from 395 to 415 nanometers in order to produce fluorescence of the leak detection dye that leaks from the system.

Notably, the claimed 395 to 415 nanometer radiation provides two important but different functions: (i) sufficient visible radiation for the operator to visibly locate where the beam is pointing; and (ii) sufficient UV radiation to cause the dye to fluoresce. Thus, the claimed wavelength range is not optimized for either visible light or

fluorescence, but is a compromise wavelength range to accomplish both of these disparate functions at the same time. This contrasts with the prior art which fails to disclose these two functions in a single narrow-band radiation source, and in which the radiation wavelength is typically precisely matched to the dye fluorescent wavelength.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

For the instant appeal, Appellant hereby requests review of the rejection of independent Claim 35 under 35 U.S.C. §103(a) as being unpatentable over Kalley in view of Applicant's admissions of prior art.

ARGUMENT

While the Applicant appreciates the Examiner's careful consideration of this case, Applicant nevertheless submits that the Examiner has erred in:

1. Failing to appreciate the critical nature of the claimed 395 to 415 nanometer radiation in providing two disparate functions at the same time: (i) sufficient visible radiation for the operator to visibly locate where the beam is pointing; and (ii) sufficient UV radiation to cause the dye to fluoresce;

2. Failing to appreciate the submissions regarding unexpected results in the October 29, 2003 PTO interview where the emitted radiation was shown to be both visible and sufficient to stimulate fluorescence of a dye; and

3. Failing to appreciate that Kalley teaches away from the present invention by teaching that the emitted radiation should be either 300-400 nm or 400-500 nm, and should be selected to match the dye.

Accordingly, Applicant respectfully submits that the Examiner has not carried his burden of making out a *prima facie* case of obviousness with respect to Kalley, whether taken alone or in combination with Applicants' discussion of known art.

I. Description of Cited References

Kalley: United States Patent No. 6,590,220 B1 was issued on July 8, 2003 and is citable under 35 U.S.C. §102(e). Kalley discloses a light source for examining sites in heating, ventilating, and air conditioning systems for leaks using a fluorescent dye. In an aspect of Kalley, the light source is reflected onto the target, and is used to examine a substance when the substance is excited by the wavelength of light emitted from the light source. The light source includes a housing having a light outlet, and a low-voltage lamp positioned in the housing and oriented to emit light through the light outlet. The low-voltage lamp emits light of a wavelength that is "restricted to a predetermined range effective to enhance the detection of emission of light from a substance when the substance is excited by the wavelength of light emitted from the lamp." (Col. 2, lines 16-19). The light source can include a low voltage lamp or a low heat generating lamp, such as a light emitting diode (LED). The light can be in the blue wavelength range (between 400 and 500 nm), or the UV range (between 300 and 400 nm). (Col. 4, lines 24-29). Thus, Kalley teaches selecting either blue or UV radiation, matched to the dye being used.

Applicant's Admissions of Prior Art: As stated in the final Office Action on page 4, the Examiner has indicated that "the instant Specification suggests Nichia Corporation as a source for LED's (Specification, pg. 14), and wherein Applicant admits that such LED's are known to draw 0.2 Watts of power." As also stated in the final Office Action on page 4, the Examiner has indicated that "[a]lthough the Kalley reference discloses an array of LED's, the reference does not explicitly disclose that the cluster of LED's is less than 2 inches in diameter. The instant Specification suggests that as many as 36 Nichia LED's may be used in such a configuration".

II. Claim 35

Independent Claim 35 recites a novel combination of structure and function whereby an inspection lamp for use in detecting leaks uses a fluorescent leak detection dye from a liquid or air circulating systems. The lamp includes: a) a flashlight having a housing; b) a plurality of LEDs housed within the housing and arranged in a cluster or array of less than 2 inches diameter; and c) batteries contained within the flashlight to supply direct current power to the LEDs, the LEDs in total consuming 7.2 watts or less. The flashlight is untethered and handheld. Each LED produces a narrow beam of approximately 30 degrees or less that projects directionally intense radiation. The radiation is emitted directly without reflection from the LEDs to the system, beyond the housing of the flashlight. The radiation is unfiltered between the LEDs and the system. Each LED emits violet, near ultraviolet radiation having most of its energy within a visible range of from 395 to 415 nanometers in order to produce fluorescence of leak detection dye that leaks from the system.

III. Personal Interview with Examiner

A personal interview with the Examiner (hereinafter "Interview") was conducted on October 29, 2003. The attendees at the Interview included the Examiner, Vincent P. Barth; the Examiner's supervisor, Primary Examiner Richard A. Rosenberger; the Applicant, Jack Brass; the Applicant's local Canadian attorney, Robert H. Wilkes; and the Applicant's attorney, Richard P. Bauer. An Interview Summary that memorializes the Interview is attached to this Appeal Brief.

As indicated on the Continuation Sheet of the Interview Summary, the Applicant demonstrated the operation of an LED flashlight according to the present invention,

which, as recited in independent Claim 35, emits visible violet and near ultraviolet light having most of its energy within the 395-415 nm wavelength range. The demonstration used a dye that has a peak fluorescence for incident radiation of 440 nm. The Applicant also demonstrated several other LED flashlights that emit ultraviolet light at other wavelengths within the 400-500 nm range allegedly disclosed in Kalley. Most notably, in one example, the Applicant demonstrated an LED flashlight having a peak output at approximately 470 nm and including light energy at approximately 440 nm, the same wavelength as that coinciding with the peak fluorescence of the dye. The Applicant also provided yellow-tinted plastic eyewear for use in observing the fluorescence effects resulting from the 470-nm flashlight.

In so doing, the Applicant was able to show a sharp contrast in the results as between the LED flashlight according to the present invention and the other flashlights. First, the fluorescence of the dye was visibly and strikingly more apparent when using the LED flashlight according to the present invention than when using the 470 nm flashlight, which was not expected since the 470 nm radiation was of similar distance from the 440 nm dye as the 395-415 radiation according to the present invention. Second, the emission of near-ultraviolet visible violet light by the LED flashlight according to the present invention provided a targeting effect whereby the operator can easily see where the beam is pointing, whereas the emission of the 470 nm radiation had a tendency to interfere with the fluorescence, thus requiring the use of eyewear to filter out the emitted light, and thereby reducing the efficacy of any targeting effect.

The targeting effect is important in many practical applications, because often, in attempting to diagnose a leak within a heating, ventilating, or air conditioning system, there may be many obstructions. For example, when looking under the hood of an

automobile, the operator is typically in a low-light situation and many hoses, tubes, and other equipment block the view of the air conditioning system components.

IV. Unexpected Results are an Objective Factor that Rebuts a *Prima Facie* Case of Obviousness

By virtue of the demonstration shown to the Examiner and the Primary Examiner at the Interview, the Applicant successfully showed that the use of the claimed wavelength range of 395-415 nm produces unexpected results with respect to other wavelength ranges disclosed in Kalley. This showing of unexpected results manifests itself both because the claimed wavelength range of 395 – 415 nm was shown to be a critical range, and because Kalley teaches away from the use of such a range in the manner shown in the demonstration.

A. The 395 – 415 nm Wavelength Range Has Been Demonstrated to be a Critical Range

The Manual of Patent Examining Procedure ("MPEP"), section 2144.05, addresses the question of how to properly address a question relating to obviousness of ranges. Specifically, MPEP 2144.05(III), first paragraph, states:

> Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range. "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims . . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Woodruff*, 919 F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

At pages 2-3 of the final Office Action, the Examiner states that "particular fluorescent dyes may require a particular spectral range. Therefore, those practicing the Kalley invention would likely expect that the spectral output of the lighting device (and thus the particular LED's) would be selected depending on which dye is present, and would thus be somewhat variable." Appellant agrees with these assertions, which are evidenced by the following text from Kalley at column 3, line 64 – column 4, line 6:

> **Detection of fluorescence can be enhanced when the wavelength of the light emitted from the light source is restricted** so that little or no light of the emission wavelength comes from the light source (**e.g., little or no light beyond the excitation wavelength**, extending into the visible region). The wavelength of the light emitted from the light source can be controlled by use of reflectors with faceted surfaces or dichroic coatings. The wavelength can be further influenced by passing the light through a filter before it exits the light source.
> [Emphasis added.]

This passage, as indicated by the Examiner's statements, logically leads to the conclusion that one of ordinary skill, when practicing Kalley, would choose a particular wavelength range based upon which dye is present, rather than using the LED flashlight according to the present invention, for which the wavelength range is restricted to the 395 – 415 nm range, and which performs both visible and fluorescence functions.

Notably, the 395 – 415 nm wavelength range chosen by the Applicant is chosen not to match the peak wavelength at which the dye reacts; instead, it is chosen because the wavelength provides acceptable reemitted radiation from the dye, while limiting detrimental effects of reflected visible incident light and simultaneously providing a targeting effect by the reflected incident light. Appellant notes that Kalley does not teach choosing a wavelength range that provides a targeting effect in combination with

acceptable reemitted radiation and limited detrimental effect of reflected visible incident light.

Therefore, if one of ordinary skill in the art were relying on the disclosure in Kalley, it would be expected that one would not restrict oneself to the 395 – 415 nm range, because the choice of the wavelength range would be dependent on the dye being used. More specifically, for the dye used in the demonstration during the Interview, one of ordinary skill relying on Kalley would surely have chosen the 470-nm LED flashlight and yellow glasses over the LED flashlight according to the present invention. Thus, the demonstrability of superior results using the LED flashlight according to the present invention would be unexpected by one of ordinary skill, based on Kalley. In this manner, the 395 – 415 nm wavelength range was shown to be a critical range during the Interview.

B. The 395 – 415 nm Wavelength Range Provides Unexpected Results

At page 3 of the final Office Action, the Examiner notes that "Kalley also explicitly discloses that the LED's may be selected to have a narrow spectral output, so as to avoid the need for filters". Kalley teaches filtering of incident radiation in order to minimize the amount of incident (exciting) radiation viewed by the operator. In addition to narrowing the spectral output of the light source, Kalley teaches filtering of incident radiation by the operator through the use of a filter lens so that only wavelengths emitted by the dye, i.e., non-incident wavelengths, reach the operator. See Kalley, column 7, lines 43 – 55. Yellow filter eyewear that is often used for this purpose was shown to the Examiner during the Interview.

However, as shown during the demonstration at the Interview, despite the use of the yellow filter eyewear, and despite this teaching of Kalley, the use the LED flashlight according to the present invention at the 395-415 nm wavelength range yielded superior results to those obtained using the 470-nm LED flashlight. Thus, it would be surprising to one of ordinary skill relying on Kalley that there is a critical range of reflected visible incident radiation that is in fact desirable.

Therefore, it would be unexpected and surprising to one of ordinary skill relying on Kalley that a light source should be chosen to emit violet, near ultraviolet radiation having most of its energy within a visible range from 395 to 415 nanometers in order to produce fluorescence of leak detection dye. The claimed invention provides synergism as it provides greater than expected results in combining a targeting effect with acceptable reemitted radiation and limited detrimental effect of reflected visible incident light. In this manner, the critical 395 – 415 nanometer range provides a significant, practical advantage.

C. Kalley Teaches Away From the Use of a Specific, Narrow Wavelength Range Not Chosen With Respect to the Dye Being Used

In its discussion relating to rebuttal of a prima facie case of obviousness with respect to overlapping ranges, the MPEP also refers to "teaching away" by a reference. Specifically, MPEP 2144.05(III), second paragraph, states:

> A prima facie case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claim invention. [See] *In re Geisler*, 116 F.3d 1465, 43 USPQ 2d 1362 (Fed. Cir. 1997).

As described above, Kalley expressly teaches away from several aspects of the present invention as recited in independent Claim 35 and as demonstrated in the Interview.

Specifically, Kalley expressly teaches away from the use of a light source having a fixed wavelength range of 395 - 415 nm that is not chosen on the basis of the dye being used. The text at column 3, line 64 – column 4, line 6 of Kalley (shown above) illustrates the teaching of Kalley that detection of fluorescence can be enhanced when the wavelength of the light emitted from the light source is ***restricted*** so that little or no light beyond the excitation wavelength comes from the light source. The excitation wavelength, of course, is a function of the dye being used; each dye has a characteristic excitation wavelength pattern. Therefore, in this manner, Kalley teaches away from the use of the 395 – 415 nm wavelength range, regardless of the dye being used. However, as recited in independent Claim 35, the present invention requires the use of the 395 – 415 nm range, regardless of the dye being used.

Kalley also expressly teaches away from the desirability of reflected visible incident light. The same passage from Kalley, at column 3, line 64 – column 4, line 6 (shown above) also indicates that detection of fluorescence can be enhanced when the wavelength of the light emitted from the light source is restricted so that little or no light of the emission wavelength comes from the light source. In this manner, Kalley teaches that emission light outside of the excitation wavelength should be filtered out. Conversely, the present invention, as recited in independent Claim 3, expressly requires the use of a specific range of emitted radiation from the light source at which leak detection dye is well identified by the naked eye without detrimental effect on low light or night vision, namely violet, near ultraviolet radiation having most of its energy within a visible range from 395 to 415 nanometers in order to produce fluorescence of leak detection dye. Despite the teaching of Kalley, such radiation provides a desirable

targeting effect and excellent visible fluorescence results, as shown in the demonstration at the Interview.

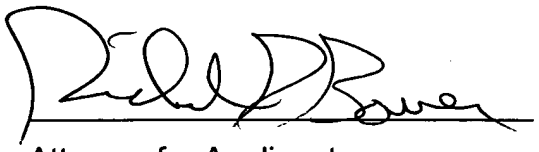
In view of the criticality of the 395 – 415 nm wavelength range recited in independent Claim 35, and the unexpected results demonstrated at the Interview, and in view of the express "teaching away" by Kalley from the use of such a specific and narrow wavelength range that is chosen regardless of the dye being used and also chosen despite the emission of visible, unfiltered light outside of the excitation wavelength, Appellant hereby submits that the present invention yields results that would have been completely surprising and unexpected by one of ordinary skill in the art relying on Kalley at the time of the invention. Accordingly, Appellant submits that any *prima facie* case of obviousness over Kalley should be determined as being overcome by virtue of these unexpected results.

CONCLUSION

In view of the above, Appellant submits that Claim 35 is not unpatentable as being obvious over Kalley and Applicant's admissions of prior art. Accordingly, reversal of the final rejection, allowance of the rejected claim, and issuance of the subject patent application are respectfully requested.

Appellant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 625-3507. All correspondence should continue to be directed to our address given below.

Respectfully submitted,



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CLAIMS APPENDIX

Claim 35 (Previously Presented) An inspection lamp for use in detecting leaks using a fluorescent leak detection dye from a liquid or air circulating systems, the lamp comprising:

a) a flashlight having a housing;

b) a plurality of LEDs housed within the housing and arranged in a cluster or array of less than 2 inches diameter; and

c) batteries contained within the flashlight to supply direct current power to the LEDs, the LEDs in total consuming 7.2 watts or less,

wherein the flashlight is untethered and handheld,

wherein each LED produces a narrow beam of approximately 30 degrees or less that projects directionally intense radiation,

wherein the radiation is emitted directly without reflection from the LEDs to the system, beyond the housing of the flashlight,

wherein the radiation is unfiltered between the LEDs and the system, and

wherein each LED emits violet, near ultraviolet radiation having most of its energy within a visible range of from 395 to 415 nanometers in order to produce fluorescence of leak detection dye that leaks from the system.

EVIDENCE APPENDIX

No evidence is submitted pursuant to 37 C.F.R. §§1.130,1.131, or 1.132.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings.